

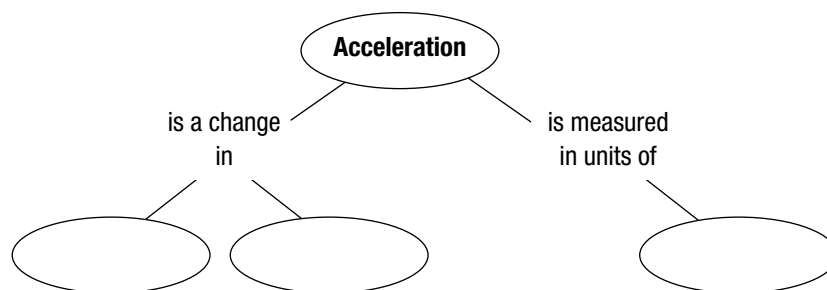
## Chapter 11 Motion

**Section 11.3 Acceleration****(pages 342–348)**

*This section describes the relationships among speed, velocity, and acceleration. Examples of these concepts are discussed. Sample calculations of acceleration and graphs representing accelerated motion are presented.*

**Reading Strategy (page 342)**

**Summarizing** Read the section on acceleration. Then complete the concept map to organize what you know about acceleration. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

**What Is Acceleration? (pages 342–345)**

1. The rate at which velocity changes is called \_\_\_\_\_.
2. In terms of speed and direction, in what ways can an object accelerate? \_\_\_\_\_  
\_\_\_\_\_
3. Because acceleration is a quantity that has both magnitude and direction, it is a(n) \_\_\_\_\_.
4. Is the following sentence true or false? Acceleration is the result of increases or decreases in speed. \_\_\_\_\_
5. Ignoring air resistance, a rock in free fall will have a velocity of \_\_\_\_\_ after 4.0 seconds.
6. A horse on a carousel that is moving at a constant speed is accelerating because \_\_\_\_\_.
7. Describe constant acceleration. \_\_\_\_\_  
\_\_\_\_\_

**Calculating Acceleration (pages 345–346)**

8. Write the equation used to calculate the acceleration of an object.  
\_\_\_\_\_

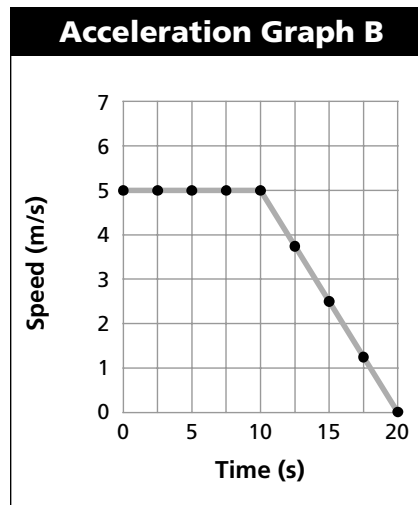
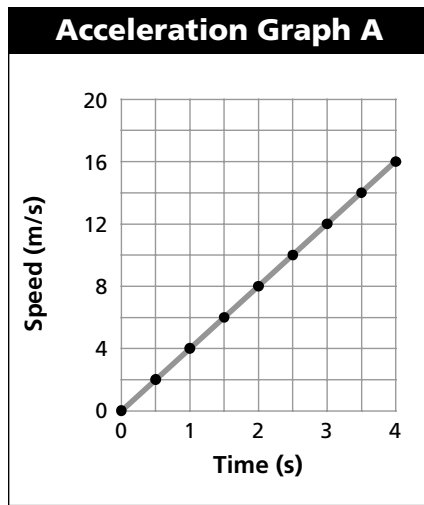
## Chapter 11 Motion

9. Is the following sentence true or false? When the final velocity is less than the initial velocity of an object, the acceleration is negative. \_\_\_\_\_
10. A skateboarder begins down a ramp at a speed of 1.0 m/s. After 3 seconds, her speed has increased to 4.0 m/s. Calculate her acceleration.
  - a. 1.0 m/s<sup>2</sup>
  - b. 3.0 m/s<sup>2</sup>
  - c. 5.0 m/s<sup>2</sup>
  - d. 9.8 m/s<sup>2</sup>

### Graphs of Accelerated Motion (pages 346–348)

11. A speed-time graph in which the displayed data forms a straight line is an example of a(n) \_\_\_\_\_.

For questions 12 through 15, refer to the graphs below.



12. Graph A represents the motion of a downhill skier. How fast was the skier moving after traveling down the hill for 2.5 seconds? \_\_\_\_\_
13. In which graph does an object move at constant speed during the first 4 seconds? \_\_\_\_\_
14. Graph B represents the motion of a mountain biker. What is the biker's speed at times of 10 s and 20 s? \_\_\_\_\_
15. Determine the acceleration of the mountain biker during the 10 second to 20 second time period. Show your work.

\_\_\_\_\_

\_\_\_\_\_

16. The plotted data points representing acceleration in a distance-time graph form a(n) \_\_\_\_\_.

### Instantaneous Acceleration (page 348)

17. The measure of how fast a velocity is changing at a specific instant is known as \_\_\_\_\_.